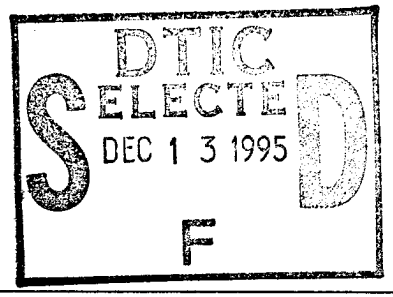

CHINA'S IMPORT OF FOREIGN TECHNOLOGY,

A CHRONOLOGY:

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This compilation of significant transfers of technology to China since 1984 concentrates on technology with basic industrial or potential military applications. Consulting services and training in generalized skills, such as management and computer programming, are also included. This study is based on a variety of sources, including United States and foreign newspapers, trade journals, newsletters, and wire services.

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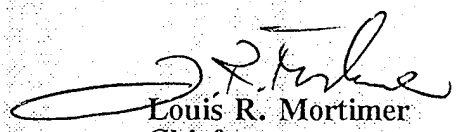

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PREFACE

This selective compilation and analysis of significant transfers of technology to China in 1987 concentrates on technology that has basic industrial or potential military applications. Consulting services also are included. The chronology is based on a variety of sources, including United States and foreign newspapers, trade journals, newsletters, and wire services.

The basic unit recorded is the transaction. The record for each transaction includes the item of technology, the foreign and Chinese parties involved, the terms and value of the agreement, and additional information that may indicate the transaction's significance. Transactions are grouped in broad categories such as electronics or transportation equipment. Depending on user requirements, further subsets of transactions, such as those involving a particular item, foreign country, or end user, may be produced.

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SUMMARY

China's ambitious plan to quadruple its production by the year 2000 depends on the successful introduction of foreign technology. In both the civilian and military sectors, the policy is to import suitable technology that is as advanced as possible rather than to import finished products. Chinese importers usually attempt to include technology transfer and training in contracts for the purchase of advanced equipment. Military modernization is to be funded by rapid economic growth and to be achieved through domestic production of advanced weaponry rather than by large-scale purchases from abroad.

The five major obstacles to successful realization of this modernization policy are:

- the reluctance of foreign corporations to transfer advanced technology to or to risk capital in China;
- delays and bureaucratic obstruction caused by China's import and foreign exchange controls, which are intended to counter the large demand for finished and consumer goods;
- foreign export controls;
- the tendency for many Chinese organizations to seek short-term benefits by importing finished goods and consumer products rather than making the long-term effort to master technology or to invest in energy, transportation or other bottleneck sectors of the economy; and
- the difficulties many Chinese enterprises have in absorbing technology.

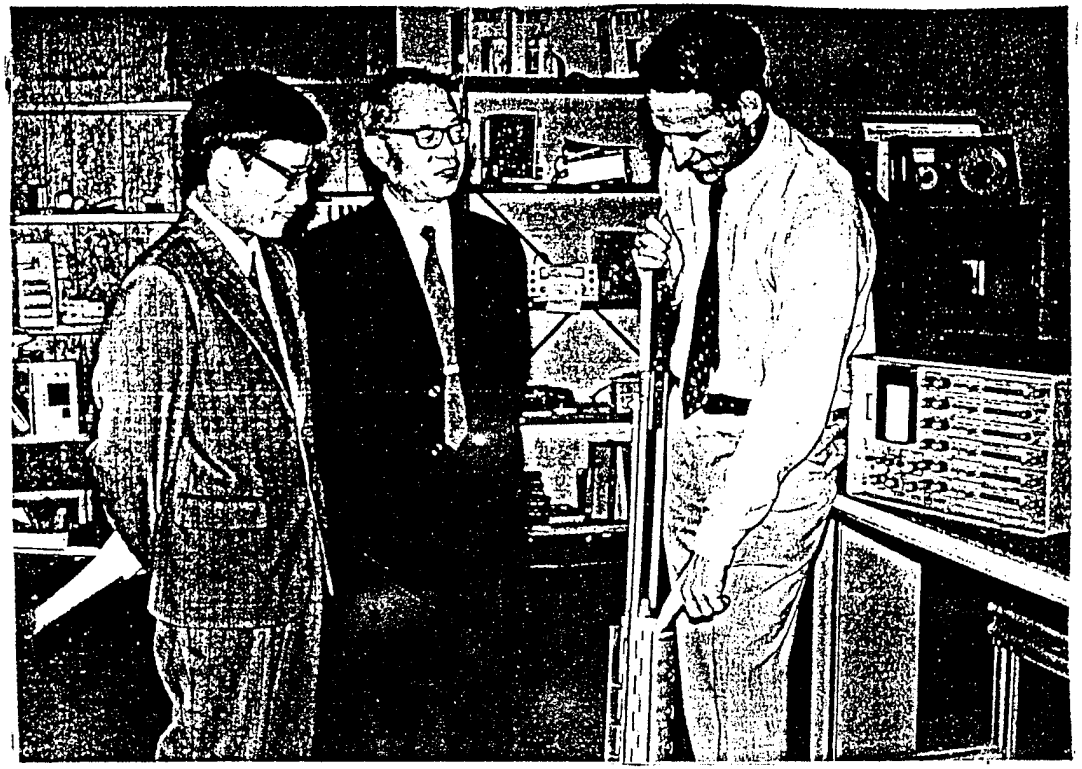
The first obstacle has been the motive for major efforts to reform China's commercial and legal system and to improve the investment climate to assure foreign corporations that China is a secure and promising place to invest in and do business with. The second problem has proved more intractable and has been exacerbated by efforts to reduce the foreign trade deficit and to protect Chinese industry from foreign competition. The third obstacle, which loomed large in the early 1980s, has been addressed quite successfully by persistent diplomatic activity,in which Chinese leaders have made foreign nations' technology export controls major bilateral issues. The government has supplemented diplomacy with quiet attempts to circumvent export controls. The fourth problem, which reflects fundamental aspects of China's economic and local political structure, has proved difficult to remedy. China's leaders see the ultimate solution as thorough economic reform, and in the short-term have resorted to strict central controls over foreign exchange and imports. The fifth obstacle is another long-term problem that requires raising the skills of China's technical and managerial workforce.

In addition to addressing the obstacles to technology transfer, China's leaders have had to determine both overall priorities and the most effective methods of introducing foreign technology. In 1987 there was renewed public discussion of alternative strategies for transferring and assimilating technology. The four main strategies were import substitution, upgrading heavy industry, using joint ventures as catalysts for raising standards through subcontracting, and concentrating on export-oriented light industry to earn foreign exchange to import more technology.

A priority of the 7th Five Year Plan (1986-90), as it was of the 6th Five Year Plan (1981-85), is raising the technical level of existing enterprises rather than importing complete new plants. The plan stresses investment in energy, transportation, and electronics and emphasizes upgrading existing facilities. Investment in military equipment has a low priority, reflecting the relatively low ranking of military needs in the "Four Modernizations" and recognition of the huge costs necessary to equip China's armed forces with substantial quantities of foreign material. However, much of the recently imported technology, especially in the fields of electronics and telecommunications, has immediate military uses, and items in such fields as transportation equipment or metallurgy often have potential military applications.

Most transfers of technology to China are in the form of purchases, assembly agreements, licensing or coproduction contracts, joint ventures, equipment leasing, or consulting and training agreements. The precise form, scope and content of these commercial transactions depend on the agreement negotiated between the two parties.

For effective technology transfer, the two most important factors are the duration of the contract and the ease and frequency of consultation between the donor and the recipient of the technology. Joint ventures or long-term coproduction agreements are thus more effective than one-time sales of equipment or licenses. Frequent direct contact and consultation between Chinese factories and foreign providers of technology are more effective than transactions mediated through China's national import-export corporations or central ministries. Since the early 1980s, an increasing number of decisions on specific items of technology have been made at the level of the factory or municipal industrial commission rather than at the central level, and an increasing number of contracts have provided for training and consultation. These trends indicate increasingly successful assimilation of foreign technology by Chinese factories.



Source: Export Today, March/April 1988, p. 39.

Figure 1. Geophysical instruments produced in the United States are modified to suit Chinese users.

TRENDS IN TECHNOLOGY TRANSFER, 1987

National Statistics

In a break with past practice, China published no aggregate figures for 1987 technology imports. The Ministry of Foreign Economic Relations and Trade (MOFERT) did release statistics on contracts for the import of "high technology" during the first six months of 1987, when 301 contracts worth US$1.57 billion were signed. These figures indicated a moderate decline in the number and monetary value of technology import contracts over the first six months of 1986, when 476 contracts worth US$1.48 billion were signed. (The decline in the value of the US dollar accounts for the decline in the value of the contracts.) The unexplained failure to publish the annual statistics may have reflected reluctance to publicize declining figures, a change in MOFERT's internal accounting and reporting practices, or perceived incompatibility with the publicity emphasis on exports.

The Balance of Trade

In 1987 China was generally successful in reducing the foreign trade deficit by boosting exports and limiting imports. MOFERT figures, which measure only financial transactions, showed a trade surplus of US$1.87 billion, while those of the General Administration of Customs, which record goods crossing China's borders (including barter trade with other centrally planned economies) showed a deficit of US$3.94 billion. Both sources, however, showed great improvement over the substantial trade deficits of 1986, and agree in attributing the improved trade performance to China's strategy of increasing exports while holding imports constant.[1] Much publicity went to the export drive and very little to imports. And, when technology imports were discussed in China's media, the emphasis was on the need to curb wasteful and duplicative imports and to devote more attention to assimilating technology already imported.

National Policy

The overall policy of giving priority to imports of advanced technology rather than of finished goods or consumer goods remained unchanged, but the drive to export and to conserve foreign exchange affected implementation of that policy. Foreign investment and joint ventures with foreign corporations continued to be welcomed, and the authorities made it clear that foreign investments or cooperative ventures that exported some or all of their output would be especially favored. Such ventures usually used low-or medium-level technology and were attracted to China primarily for its cheap labor. Thus, MOFERT announced in January 1987 that foreign-funded companies could import machinery and materials to produce goods for export without the usual import licenses. That same month the Ministry of Finance promised tax reductions to technologically advanced enterprises that exported some of their products. In May the Bank of China began offering low-interest loans to foreign-funded enterprises that were

"technologically advanced" or export-oriented. In August the State Economic Commission announced that the government would introduce new regulations, tax preferences and exemptions, and draft regulations on technology assimilation to accelerate assimilation of imported technology. In October MOFERT announced that the new laws would replace existing procedures for approval of technology import contracts, setting out ground rules for approval and defining which types of technology import would fall under (central) state administration and which Chinese corporations would be authorized to negotiate technology import contracts.[2] In December Renmin Ribao (Beijing) identified "reckless and duplicate imports of technology" as a serious problem, and called for the government to formulate strict policies to end such imports.[3]

Recentralization of Import Approval

Since 1980, China's policy on technology imports has fluctuated between central control and devolution of decisionmaking authority to local administrations and end-users. In 1987 the pendulum swung back toward central control, propelled by the effort to cut spending on imports. Central authorities did not attempt to dictate choices of specific items of equipment or to prevent enterprises from negotiating directly with foreign vendors of technology, but exercised control through import licenses, review of contracts, and stricter limits on foreign exchange. Ministries and commissions of the central government began issuing lists of designated import substitutes--Chinese products (often incorporating foreign technology) that were to be purchased in place of imports. Although none of these measures was intended to curtail imports of advanced technology, their cumulative effect was to delay all such purchases, to discourage some, and to retard the assimilation of imported technology by reducing the foreign exchange used for training, travel, and consultation.

Policy Options

The effort to limit imports seems to have encouraged further discussion of technology transfer policies. Within the broad policy of favoring cooperation with foreign firms to import advanced technology, there is room for many distinct approaches, programs, and choices. Although such choices have been discussed since the late 1970s, the 1987 restrictions on imports and competition for foreign exchange raised the saliency of the issues. These policy choices on priorities and allocation of scarce resources are inherently political. Throughout the year the Chinese press reflected differing opinions on the most effective and economical means to import and assimilate technology. Proposals fall into four main categories: import substitution, upgrading heavy industry, joint ventures as catalysts for raising the technical levels of their subcontractors, and using light industrial exports to earn the foreign exchange to import more technology in an export-led cycle.

Import Substitution

At a State Council meeting in May 1987, then Premier Zhao Ziyang called for strict limits on imports of equipment for new chemical fertilizer plants and for speeding up domestic production of such

Source: China Machinery [Hong Kong], No. 6, 1987, p. 28.

Figure 2. China plans to expand production of vehicles designed for Chinese roads.

equipment. Zhao said,"We must use Chinese-manufactured equipment even if it is of slightly lower quality," and "When purchasing equipment in the future, we must first invite domestic bids." Lin Zongtang, Vice Minister of the State Economic Commission (SEC), stressed that Zhao's statements applied to equipment in all fields.[4]

In late August the State Commission for the Machinery Industry issued a list of 50 domestic machinery and electronics products which could replace imports and promised more lists by the end of 1987. The Commission asserted that the domestic products were of equal quality with imports but cost 30 to 50 percent less and that most domestic products on the list required that only 15 percent of the cost be paid in foreign exchange.[5] In late September the State Economic Commission took responsibility for approving imports of telecommunications equipment from the Ministry of Posts and Telecommunications and MOFERT. Under the supervision of then Vice Premier Li Peng and State Councillor Zhang Jinfu, the SEC was to handle all contracts for imports of telecommunications equipment. Imported program-controlled telephone exchanges were to be replaced by the S-1240 system, produced by the Shanghai-Bell Telephone Equipment Manufacturing Co., a Sino-Belgian joint venture. Imports of optical fibers and digital microwave communication systems also were to be restricted in favor of products of China's Post and Telecommunications Industry Corporation, which were at early 1980s international standards but cost only one-third as much as imports.[6]

Although the logic of substituting cheap domestic products for expensive foreign goods of equivalent quality is clear, the protectionist motivation of Chinese industries is equally clear. To the extent that protectionism shields domestic industries from foreign competition, it also reduces incentives for technical upgrading and the continued assimilation of imported technology. The Chinese press repeatedly condemned consumers for their irrational preference for imported over domestic goods. While attitudes of uncritical adulation of foreign products undoubtedly exist, the criticism overlooks the problem of after-sales service and spare parts. Chinese manufacturers have until very recently been unconcerned about marketing, focusing instead on meeting production quotas, increasing production volume, and obtaining the supplies necessary for production. Foreign corporations, especially those from Japan, have been much more concerned with providing support and service to their customers. The more advanced the technology, the more is after-sales support necessary for effective utilization of new equipment. If Chinese manufacturers of machinery and electronics or telecommunications equipment cannot or will not provide adequate user support, then the economic benefits of import substitution will be less than originally expected.

Priority to Heavy Industry

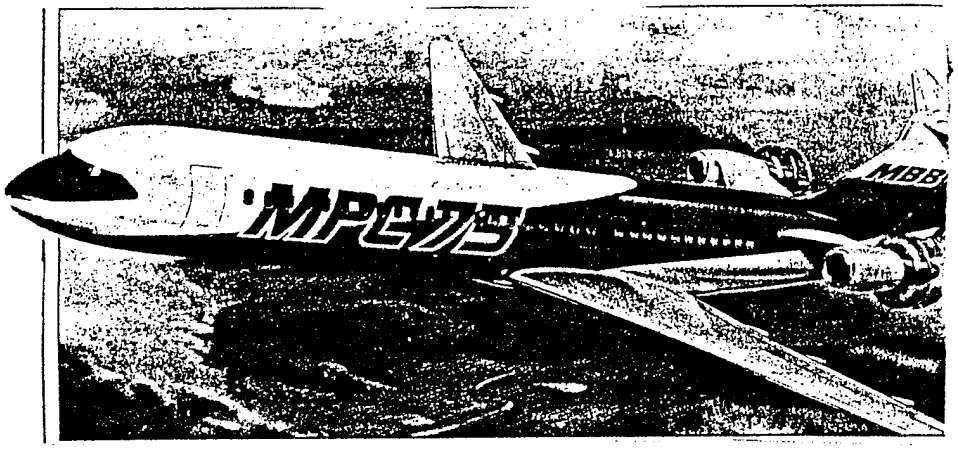
In July 1987, Sun Zonghao, Director of the SEC's Bureau of Technological Transformation, noted that the proportion of large industrial units that had improved their technology was significantly lower than that of small and medium-sized industrial units. He indicated that during the current 7th Five-Year Plan (1986-1990) technical transformation of heavy industry will be more important and that attention will shift to large industrial units. Sun distinguished between advanced but mature technologies

(such as those in metallurgy or electric power generation) and high technologies that are evolving very rapidly. The first could be transferred to China through licensing and purchase of patents, while the more dynamic high technology is difficult to acquire and would best be obtained through joint ventures. As an example of renewed emphasis on large enterprises and heavy industry, the Ministry of Aviation Industry announced plans to produce and even to export large (150-seat) airliners. According to the China National Aero-Technology Import and Export Corporation (CATIC), China is discussing cooperative ventures with foreign aircraft manufacturers that will permit China to produce aircraft engines, electronic systems, and airframes.

The relative failure of China's large-scale and heavy industry to import and assimilate advanced technology is a significant problem, which illustrates the shortcomings of China's unreformed economic system and the need for further economic reform. Failure to import and assimilate technology is a symptom of a more fundamental problem that will not be solved by allocating more money to import technology. At the least, importing technology for heavy industry would have to be part of an integrated economic policy that would include increased autonomy for large enterprises, improved management, and fairly comprehensive price reform. Under China's existing economic system, heavy industry has no incentive to take the risks associated with innovation, such as importing technology. (For the enterprise involved, transferring technology is a type of innovation, and one which usually requires further changes in internal organization and customary procedures. Innovation is always risky, disturbs existing habits and lines of authority, and, therefore, tends to be resisted by organizations.) Furthermore, much heavy industry operates with relatively mature technology, which can only be upgraded with large capital investment. Calls for more imports of technology for heavy industry fail to address the question of the costs of doing so, or of the source of the funds necessary to upgrade the technical level of existing large-scale plants. For example, the Ministry of Aviation Industry's plans (or hopes) for domestic production of large airliners are ambitious and would require large investments. Producing airliners for the international market is a very risky enterprise, and few international banks would loan money to Chinese aircraft manufacturers eager to break into world markets.

Joint Ventures as Catalysts

Apart from their direct introduction of advanced technology and equipment, joint ventures are expected to boost overall technical levels by "sourcing" (subcontracting for the production of) components to local suppliers who will raise their technical levels through consultation with the joint venture. A joint venture might begin operations by assembling imported components, next begin producing some components itself, and then go on to purchase components from local subcontractors. Both Chinese and foreign partners should be motivated to increase the local content of their products, to minimize foreign exchange spent on imported components, and to develop low-cost Chinese sources of components such as electronic or automotive parts that can be exported or used in the foreign partner's production in other countries. Such joint ventures as the Volkswagen and Peugeot automobile factories and Shanghai's Wang Computer manufacturing enterprise are reported to be making great efforts to develop local suppliers.



Source: China Transport [Hong Kong], No. 4, 1988, p. 63.

Figure 3. The planned Multipurpose Communter Aircraft to be jointly developed by CATIC and Messerschmidt-Bolkow-Blohm

In this mode of technology transfer, joint ventures act as catalysts, centers of innovation, and standard setters, providing local factories with models for emulation and with incentives to upgrade their products. This approach, which reflects the actual process of technology transfer and upgrading in many countries, sees technology transfer, diffusion, and assimilation as a long-term, step-by-step process. The intended goal is not only, or primarily, the operation of a single joint venture factory; rather it is the improved levels of skill and performance of scores or hundreds of indigenous factories, which are affected by waves or ripples of innovation and new technology spreading from the joint venture. The approach assumes further development of a market economy in which joint ventures are free to contract with suppliers and to deal with whichever supplier can offer the highest quality at the lowest cost. The incentive for suppliers to risk innovation and technical upgrading is provided by market forces.

So far, however, success at localizing production has been minimal, largely because market forces do not as yet exist to motivate potential suppliers to raise their technical levels and joint ventures are not free to make contracts with suppliers and enforce quality standards and penalties for late deliveries. Apart from the low technical level of potential suppliers, which is the problem technology transfer is intended to solve, all of the commonly recognized problems of China's unreformed economy limit successful development of domestic subcontractors. The Volkswagen automotive joint venture in Shanghai (which currently imports even screws from Volkswagen factories in other countries to produce its "Santana" model) has found that all proposals for subcontracting are subject to approval by the China National Automotive Industry Corporation and by the "Santana Horizontal Localization Office," an agency of the Shanghai Municipal Government. Even unspecified military departments and such ministries as the Ministry of the Astronautics Industry have a say in any proposed subcontracts. In the same vein, Shanghai's Wang Computer Development Company has found that imported components are cheaper and more reliable than those produced by Chinese manufacturers. Few domestic factories have been willing to develop parts or subassemblies because of the high costs of development and the low profit potential.[8]

Priority to Export-Oriented Industry

In contrast to stressing heavy industry or import substitution, Zhu Rongji of the State Economic Commission (SEC) urges an export-oriented policy favoring light industry. Zhu, identified as a professor of economics who is a vice minister of the SEC and the person "in charge of technology imports since 1981," told an interviewer for Liaowang (Beijing) that although the technology import policy followed since 1978 had been successful and technology imports were not about to stop, the emphasis may shift to meet changing circumstances. His basic argument was that the shortage of funds and of foreign exchange was a long-term problem that constrained choices of technology imports. Technology imports, therefore, must be part of a cycle in which technology is imported to upgrade the quality of products that are exported to earn the foreign exchange needed to import more technology. Imports also should help produce spare parts and raw materials for the machinery and electrical industries, which can expand their exports. Priority should be given to the light and textile industries in coastal areas, which provide the greater part of China's exports. Large scale technical upgrading of heavy industry or the

export of such complex and sophisticated items as airliners are thus implicitly put off to the indefinite future.

The State Economic Commission is emphasizing coordination of technology imports with production and export of products incorporating that technology. Examples are provided by the Commission's 12 major projects which aim to assimilate technology and expand exports of color televisions, digitally-controlled machine tools, assembly lines for clothing, synthetic ammonia, locomotives, coal excavators, and equipment for the production of beer.[9] This scheme demonstrates the sensitivity to foreign exchange constraints and the attempt to target promising export items to be expected from a central planning and economic commission. It probably reflects awareness of the successful export-led economic growth achieved by the Republic of Korea and Taiwan, and of the role of Japan's Ministry of International Trade and Industry (MITI) in identifying promising export opportunities.

Technology in Context

All the proposed policies demonstrate the extent to which technology imports are linked to other economic factors and the extent to which policies on importing technology are components of more general economic, political, and foreign policy issues. As the State Economic Commission's Vice Minister Zhu pointed out, the import of technology will not stop. What is at issue are the common political and economic questions of who pays and who benefits from any particular selection of technology. The assimilation of technology is inextricably mixed with the reform of the domestic economy and the incentives for innovation that are presented to any enterprise. Technology import cannot be considered in isolation from foreign trade policy and China's balance of payments.

Major Transactions in 1987

Perhaps in response to efforts to limit imports, there was in 1987 no single contract comparable to the US$4.1 billion Daya Bay Nuclear Power Plant or complete thermal power stations that accounted for much of the value of technology imports in 1986. Major investments were made in telecommunications equipment, chemical plants, and automotive engines. In contrast to previous years, relatively less was invested in production lines for computers or integrated circuits. During the year, China licensed several processes to produce chemicals more efficiently and purchased technology to permit enhanced recovery of oil and utilization of natural gas. Several control systems for oilfields, refineries, and other continuous-flow facilities, and technology for a new, state-of-the-art coal-fired power plant promised increased energy efficiency. Projects for cooperation in software development evidenced the shift in emphasis from computer production to computer applications. In May the US software and applications firm Electronic Data Systems (EDS) opened a computer services joint venture in Beijing, holding 51 percent of the investment and proposing to manage the enterprise directly with its customary standards and practices. In computers, as in other fields, the stress is on improving the productivity of existing stocks of equipment, an approach which is both necessary and congruent with the effort to minimize expenditure of foreign exchange. China continued to make major investments in telecommunications

(necessary, among other things, for effective use of computers), purchasing exchanges, production equipment, and technology from a range of European suppliers. The aviation industry benefitted from contracts with French and West German aircraft firms that called for cooperation in the design and development stages of helicopters and transport aircraft. China's aviation industry has suffered major weaknesses in design and development, and these long-term cooperative projects should provide valuable training and experience, even if the aircraft never get off the ground.

China continued its purchases of military technology from France, contracting for avionics systems for the PLA Air Force's A-5 (Qiang-5) (FANTAN) attack plane, purchasing eight antitank helicopters equipped with "HOT" antitank missiles, and signing a state-to-state military cooperation agreement covering production of military materiel. In an agreement with clear potential for China's antisubmarine warfare efforts, the State Shipbuilding Corporation signed an agreement under which Britain's Racal Corporation will be responsible for the complete weapons and electronic outfitting of a set of offshore patrol vessels and antisubmarine corvettes with Chinese hulls and engines to be produced for sale on the international market. As part of a little-publicized 1986 agreement on sale of US antisubmarine torpedoes and production facilities, in March 1987 seven Chinese specialists enrolled in a 41-week torpedo maintenance course at the US Naval Training center in Orlando, Florida. Although China's purchases of military technology and equipment remained limited, the scope and cost of such purchases was gradually increasing.

In 1987, as in previous years, most contracts were for the enhancement, incremental improvement, or technical upgrading of existing Chinese facilities or products.

NOTES

1. Country Report: China, North Korea. No.1, 1988. London: The Economist Intelligence Unit, p.23.

2. Wang Gangyi, "Switch New Tech to Full Power, States Says," China Daily [Beijing], 12 August 1988, p.1, "New Law on Hi-Tech Expected Later This Year," Ta Kong Pao Weekly Supplement [Hong Kong], 22 October 1987. p.5.

3. Wang Xingzeng, "State Statistics Bureau Figures Show Duplicate, Reckless Imports of Advanced Technologies," Renmin Ribao, Overseas Edition [Beijing], 5 December 1987, in FBIS/China, 9 December 1987, pp.21-22.

4. Xinhua, 13 May 1987, in FBIS/China, 13 May 1987, p.K6.

5. "State Announces List to Control Machinery, Electronics Imports," China Daily, Business Weekly [Beijing], 28 September 1987, p.1.

6. "China Cuts Imports of Telecom Devices," Beijing Review, 21 September 1987, p.29.

7. Erik Baark, "Technology: Altering Course on Imports," China Trade Report [Hong Kong], July 1987, p. 3.; Xie Songxin, "China Will Cooperate to Produce Big Planes," China Daily [Beijing], 20 November 1987, p.1.

8. "Joint Ventures: A Rocky Marriage," Asiaweek [Hong Kong], 11 December 1987, p.58.; "Wang's Success Is Spur to Expansion," China Daily, Business Weekly [Beijing], 26 October 1987, p.2.

9. "Technology Imports Have Been Beneficial," China Daily [Beijing], 18 September 1988, p.4.

INTRODUCTION TO CHRONOLOGY

Each transaction listed in the following chronology for the period 1 January to 31 December 1987 has nine fields: category, date, foreign firm, country, Chinese firm, Chinese end-user, item, comment, and source. These fields permit extensive cross tabulation, such as the creation of particular sets of transactions (for example, all imports of nuclear-power technology for a specific period of time or all electronics technology from France, or all foreign firms selling technology to the Number 2 Machine Tool Factory in Wuhan).

Fourteen technology transfer categories have been tabulated: chemicals, computers, electronics, energy, instruments, machinery, management, metallurgy, military, miscellaneous, nuclear, space, telecommunications, and transportation. This is a selective rather than an exhaustive list and is most complete in the areas of computers, electronics, telecommunications, and transportation. The focus throughout is on the transfer of production technology rather than of finished goods and on technology serving basic industrial or military needs rather than on consumer goods.

The category of Chinese firms refers to the central ministry or national import and export corporation that functions as a purchasing agent (except in the case of state-to-state agreements). The category of end user refers to the factory or other unit for which the item is purchased. Unless otherwise noted, all monetary values are for US dollars. It is possible to select specific Chinese factories and to list all their recent imports of foreign technology or to select a foreign firm and to identify the users of its products.

The chronology lists 148 transactions with 17 foreign countries. The preponderance of transactions with the United States (54 transactions), Japan (24 transactions), and the United Kingdom (18 transactions) reflects the sources from which the list was compiled and the focus on computers, electronics, and producer rather than consumer goods. The following table sets out the categories and foreign countries in a comprehensive fashion.

STATISTICAL SUMMARY

CATEGORY	Australia	Canada	Chile	Finland	France	FRG (Federal Republic of Germany)	Hong Kong	Italy	Japan	Luxembourg	Netherlands	Norway	Singapore	Sweden	Switzerland	UK	USA	TOTALS
Chemicals	--	--	--	--	--	--	1	--	3	--	--	--	--	--	--	2	8	14
Computers	--	1	--	--	--	--	--	--	3	--	--	--	1	--	--	1	8	14
Electronics	1	--	--	--	--	1	--	--	6	--	2	--	--	1	--	--	4	15
Energy	--	--	--	--	1	1	--	--	1	--	--	--	--	1	1	2	3	10
Instruments	--	1	--	--	1	--	--	1	3	--	2	--	--	--	--	--	6	14
Machinery	--	1	--	--	--	--	--	--	1	--	--	--	--	--	--	5	5	12
Managment	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	1	1	3
Metallurgy	1	--	1	1	--	1	--	1	3	1	--	--	--	1	--	2	4	16
Military	--	--	--	--	3	--	--	1	--	--	--	--	--	--	--	1	2	7
Miscellaneous	2	--	--	--	--	1	--	--	1	--	--	--	--	--	--	--	1	5
Nuclear	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	1
Space	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--	--	1	2
Telecommunications	1	--	--	1	--	2	--	--	1	--	--	1	--	3	--	2	6	17
Transportation	--	2	--	--	1	5	--	1	2	--	--	--	--	1	--	2	4	18
TOTALS	5	5	1	2	6	12	1	4	24	1	4	1	2	7	1	18	54	148

CHINA TECHNOLOGY TRANSFER
CHEMICALS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
01/23/87	Mitsubishi Heavy Industries (Japan)	China National Technical Import Corp.	Karamay Oilfield, Xinjiang	Liquefied petroleum gas recovery plant	The liquefied petroleum gas (LPG) recovery plant will have a capacity of 420,000 cubic meters of LPG per day, and will go onstream in October 1989. The contract is worth $4 million. ChemWeek Newswire (New York), 23 January 1987
02/00/87	M.W .Kellog Inc. (USA)	Sichuan Chemical Works, Chengdu	- - -	Low-energy ammonia process	Kellog's proprietary technology uses only 75 percent of the energy required to produce ammonia by conventional means. When it is completed in 1989 the new plant will be among the world's most energy-efficient ammonia facilities. The local content (that is, materials and equipment produced in China rather than imported) of the plant will be maximized, and Kellog will provide the basic engineering design and the most critical items, while detailed engineering will be done by the Chengdu Chemical Engineering Corp. Joint Chinese-US engineering teams will work in Houston and Chengdu. China Trade Report (Hong Kong), February 1987, p.5
02/00/87	BP Chemicals International (United Kingdom)	- - -	Ethylene complex, Liaoning	License for fluidized-bed process to produce polyethylene	China Business Review (Washington), July-August 1987, p.57

CHINA TECHNOLOGY TRANSFER
CHEMICALS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
02/20/87	Mitsui Petrochemical Industries Ltd. (Japan)	China National Technical Import Corporation	New facility, Jinan, Shandong	Plant to produce purified terephthalic acid	Kyodo (Tokyo), 20 February 1987, in FBIS/Asia and Pacific, 2 March 1987, p.C5
03/00/87	Xytel Corp. (USA)	China Petrochemical Corporation (SINOPEC)	- - -	Design and construction of computer-controlled pilot plants for energy and fertilizer research	China Business Review (Washington), July-August 1987,p.57
05/00/87	Scientific Design Company Inc. (USA)	Shanghai Petrochemical Complex	- - -	License for monoethylene glycol plant	China Business Review (Washington) September-October 1987, p.56
06/29/87	Dialog and Orbit Databases (USA)	Ministry of Chemical Industry	Scientific and Technical Information Institute	Datalink to Dialog and Orbit databases	A computer terminal at the Ministry of Chemical Industry's Information Research Institute is linked to the databases in the United States, and provides reference services to China's chemical circles. Frequent customers have included the research institute of the Beijing Oil and Chemical Industrial Corporation and an antichemical warfare army unit. China Daily (Beijing), 29 June 1987, p.4
07/00/87	TEC Electronics Corp. (Japan)	China National Petrochemical Corp.	Shanghai Petrochemical Factory	Plant and licenses for production of ethylene oxide and ethylene glycol	Japan External Trade Organization (JETRO) China Newsletter (Tokyo) No. 69, July-August 1987,

CHINA TECHNOLOGY TRANSFER
CHEMICALS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
					p.22
07/00/87	Fluor Corp. (USA)	China National Technical Import Corp.	Qilu Petrochemical Complex, Shandong	Contract to provide basic and detail engineering for a polypropylene plant	The work will be done by Sino Fluor, a joint venture of Fluor Corp. and China National Petrochemical Corp. China Business Review (Washington), January-Februrary 1988, p.56
09/00/87	DuPont Corp. (USA)	China National Chemical Construction Co.	- - -	Production lines for synthetic rubber	DuPont will transfer 3 synthetic rubber production lines to factories in Shandong, Shanxi, and Sichuan. China Business Review (Washington), January-February 1988, p.57
09/00/87	British Oxygen Co. (BOC) (United Kingdom)	Shanghai Wusong Chemical Plant	Shanghai BOC Co.	Joint venture to produce industrial gases	BOC, with a 25 percent share in the venture, will manage the plant, install a complete set of gas liquefaction equipment, and help market the products. China-Britain Trade Review (London), December 1987, p.13
10/00/87	PPG Industries Inc. (USA)	Nanchang Chemical Industrial Materials Factory	PPG-Nanchang Chemical Technology Co.	Production of precipitated silicas	The joint venture will produce, market and develop applications for precipitated silicas, which are used to reinforce rubber goods such as shoe soles. Business China (Hong Kong), 26 October 1987, p.159

CHINA TECHNOLOGY TRANSFER
CHEMICALS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
11/15/87	Hong Kong Macao International Investment Co. (Hong Kong)	Anda Chemical Plant	Longxin Chemical Co., Heilongjiang	Technology and equipment for production of chemical fertilizers and organic chemicals	The Longxin Chemical Co. is China's largest joint venture in the chemical industry. It will import French and Italian technology to produce methylmethacrylate, polymethyl methacrylate, and chemical fertilizer. It will begin operations in 1990. Beijing Review, 14 December 1987, p.33
12/17/87	BP Chemicals; M.W. Kellog Co. (USA)	China Petrochemical Corp.	Polyethylene Plant, Lanzhou	Advanced gas phase fluid bed polyethylene process technology	China Trade Report (Hong Kong), February 1988, p.15

CHINA TECHNOLOGY TRANSFER
COMPUTERS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
01/00/87	Fujitsu Corp. (Japan)	- - -	East China Teachers' College, Shanghai	Cooperation in development of scientific software	China Business Review (Washington), May-June 1987, p.58
02/13/87	Xerox Corp. (USA)	China Computer Systems Engineering Corp.	Beijing Xerox Electronic Printing Center	Joint venture for electronic printing	The center, equipped with Xerox's latest laser printing and copying equipment, will provide high-technology printing information and products. Profits will support the development of Chinese-language electronic printing software. Xinhua (Beijing), 13 February 1987, in FBIS/China, 17 February 1987, p.B1
02/16/87	Digital Equipment Corp. (USA)	China National Instruments Import and Export Corp.	- - -	Computer Service Center	A DEC computer service center will be opened in Beijing to provide spare parts and service for DEC computer clients. The two parties have already signed a contract for a computer training center in China. Beijing Review (16 February 1987), p.31
03/00/87	Argo 21 (Japan)	Beijing Computer Institute	Xinghua Computer Company, Beijing	Joint venture for software development	Japan External Trade Organization (JETRO), China Newsletter (Tokyo) No. 67, March-April 1987, p.22
04/00/87	Northgate Computer Services Ltd. (United Kingdom)	Tianjin Computing Center; Tianjin New Technology	Northgate China Computer Services, Tianjin	Joint venture to develop software	China Business Review (Washington), July-August

CHINA TECHNOLOGY TRANSFER
COMPUTERS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
		Development Co.			1987, p.59
04/09/87	General Electric Corp. (GE) (USA)	China National Technical Import Corp. (CATIC)	CAD Technical Service Center, Beijing	Consulting and training services	The CAD (computer-assisted design) Technical Service Center is a cooperative undertaking of GE and CATIC. It will provide Chinese users (of CAD equipment) with consulting and training services, spare parts and repair service. China Daily (Beijing), 10 April 1987, p.2
04/23/87	Electronic Data Systems (EDS) (USA)	Beijing Science and Technology Commission	Beijing International Information Processing Company	Computer services joint venture	This will be the largest computer center built in China. EDS will have a 51 percent share, will assume direct management of the center, and train Chinese staff both in China and abroad. China Daily (Beijing), 21 May 1987, p.2
05/00/87	Synercom (USA)	China Zhuhai Corp.	Huang Shan Computer Education Center, Beijing	Mapping and information-management system	The Huang Shan Computer Education Center is the Chinese Government's central computer training facility. China Zhuhai Corp. is a government body specializing in importing computer and telecommunications equipment. Synercom supplies database management systems. China Trade Report (Hong Kong), May 1987, p.4

CHINA TECHNOLOGY TRANSFER
COMPUTERS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
06/03/87	Fujitsu Ltd. (Japan)	Ministry of Posts and Telecommunications	- - -	Joint venture to develop software for digital telephone switching systems	The new venture will probably be set up in Fuzhou, Fujian. It is expected to give Fujitsu an advantage over other firms in obtaining future Chinese orders for hardware for digital telephone switching systems. Kyodo (Tokyo), 3 June 1987, in JPRS-CST-87-033, 7 August 1987, p.116
07/00/87	Cybernex Comp. (Canada)	- - -	No. 1 Radio Factory, Chengdu, Sichuan	Semi-automatic production line for computer terminals	China Business Review (Washington), September-October 1987, p.57
09/00/87	Altos Computer Systems (USA)	Chinese Academy of Sciences	Software Research Institute	Technical cooperation agreement	China Business Review (Washington), January-February 1988, p.58
10/12/87	Apollo Computer Corp. (USA)	China National Instruments Import-Export Corp. (Instrimpex)	Instrimpex-Apollo Computer Service Station, Beijing	Service center	Business China (Hong Kong), 12 October 1987, p.152
12/00/87	Management Science America (MSA) (USA)	Shanghai Aviation Industrial Corp.	- - -	Manufacturing software for IBM 4381 DOS/VSE system	The $270,000 sale was made by MSA's Hong Kong subsidiary, MSA International Inc. China Business Review (Washington), March-April 1988, p.59
12/00/87	Software Technology Corp. (Singapore)	- - -	China Software Technology Corp.	Joint development of application systems	The joint venture, with a total investment of $2 million, will concentrate

CHINA TECHNOLOGY TRANSFER
COMPUTERS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
					on systems for large and medium-sized enterprises, CAD-CAM (computer-assisted design and manufacturing), and for banking, aviation and transport. China-Britain Trade Review (London), March 1988, p.15.

CHINA TECHNOLOGY TRANSFER
ELECTRONICS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
01/00/87	Toshiba Corp. (Japan)	China National Electronics Import and Export Corp.	Jiangnan Semiconductor Device Factory, Wuxi, Jiangsu	Production equipment for large-scale integration (LSI) chips	The sale requires the approval of Japan's Ministry of International Trade and Industry (MITI), which monitors sale of high technology to communist countries. Business China (Hong Kong), 26 January 1987, p.16.
01/00/87	Matsushita Electronics Corp. (Japan)	Shandong Foreign Trade Corp.	Semiconductor Factory, Jinan	Linear Integrated Circuit Plant	Annual production of the plant will be five million integrated circuits for use in color television sets. Business China (Hong Kong), 26 January 1987, p. 16
01/00/87	The Singer Co. (USA)	Shizuishan Municipal Foreign Trade Commission, Ningxia Hui Autonomous region	Ningxia Nonferrous Metals Smeltery	Tantalum electrolytic consenser production line	China Business Review (Washington), May-June 1987, p.58
01/12/87	National Research Institute for Metals (Japan)	Iron and Steel Institute, Beijing	- - -	Joint research on gallium extraction	The two parties will develop technology to extract gallium from iron ore. Gallium, an essential component of many semiconductors, can at present only be recovered as a byproduct of aluminum refining. The agreement calls for a 5-year program on chemical extraction and refining of rare metals from oxides. Nihon Keizai Shimbun (Tokyo), 13 January 1987

CHINA TECHNOLOGY TRANSFER
ELECTRONICS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
03/00/87	Hitachi Ltd. (Japan)	Shanghai Meters and Electronics Import-Export Corp.	No. 19 Radio Factory, Shanghai	Technology for inspection devices to test linear analog signal processing integrated circuits	Japan External Trade Organization (JETRO) China Newsletter (Tokyo), No. 67, March-April 1987, p.21
04/00/87	Technical Center, Engineering Society of the FRG (Federal Republic of Germany)	Ministry of the Electronics Industry	Electronics Scientific Research Institute, Beijing	Two offices to promote education, training and technology transfer	The two offices, in Beijing and West Berlin, will provide information on the electronics industry, facilitate education and training, and aid the transfer of technology from the FRG to China. China Business and Trade (Washington), 23 April 1987, p. 4
05/00/87	Nissan Electric Co. (Japan)	- - -	Jinzhou Electric Capacitor Company	Plant to make capacitors used in electric power generation	China-Britain Trade Review (London), July 1987, p.15
07/00/87	Pinkinton Co. (USA)	Shanghai Meters and Computers Development Co.	Shanghai Datong Electric Circuit Co.	Joint venture to produce multi-layer, high-density, double-face printed circuits.	China Business Review (Washington), January-February 1988, p.58
08/00/87	Printronics Corp. (Australia)	Huanan Computer Corp; Guangzhou Communication Institute	Guangzhou Printronics Circuit Co.	Joint venture to produce printed circuit boards	China-Britain Trade Review (London), December 1987, p.13
10/00/87	Piezo Technology Inc. (USA)	- - -	Quartz Enterprise Ltd.	Technology for manufacture of monolithic quartz crystal filters	China Business Review (Washington), March-April 1988, p.61

CHINA TECHNOLOGY TRANSFER
ELECTRONICS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
10/22/87	Hamamatsu Photonics Ltd. (Japan)	China Nuclear Energy Industry Corp.	Beijing Hamamatsu Phototron Corp.	Joint venture to produce photoelectric sensing devices.	The new company will begin producing photomultipliers, and intends to export much of its production. Nikkei Commercial News (Tokyo), 22 October 1987, p.1
11/00/87	Asea Switchgear Inc. (Sweden)	- - -	Shanghai United Electrical Appliance Co.	Technology for zinc oxide surge arresters	China Business Review (Washington), March-April 1988, p. 61
11/10/87	Philips Corp. (Netherlands)	Ministry of Electronics Industry	- - -	Cooperative agreements	A long-term cooperative agreement to include training Chinese managers at Philips' headquarters in the Netherlands and establishing four joint ventures to produce color television tubes, video recorders, and integrated circuits for household electronic goods is signed. China Daily, Business Weekly, (Beijing), 23 November 1987, p.1
12/11/87	Philips Corp. (Netherlands)	China National Electronics Import and Export Corp.	Changde Wire Communication Factory, Hunan	Program-controlled switchboard technology and production line	Xinhua (Beijing), 11 December 1987, in FBIS/China, 15 December 1987, p.11
12/14/87	Allen-Bradley Corp. (USA)	China National Machinery and Equipment Import and Export Corporation	Allen-Bradley Enterprise Xiamen Corp.,Fujian	Programmable industrial controllers	This is a joint venture with four Chinese partners. Technical centers will be established in Xiamen, Beijing, Shanghai, and Shenyang. The first

CHINA TECHNOLOGY TRANSFER
ELECTRONICS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
					products will be programmable controllers. China Daily (Beijing), 18 December 1987, p.2

CHINA TECHNOLOGY TRANSFER
ENERGY

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
01/00/87	Prime Computer (USA)	Karamay Oil Corp.	- - -	Oil exploration computer system	Xinjiang's Karamay Oil Corp awards a $2.5 million contract to Prime Computer's Hong Kong subsidiary. Prime will supply two 32-bit computers, the FINDER software package, a computer-aided design application, related peripherals, and communications software. Business China (Hong Kong), 12 January 1987, p.7
02/00/87	Kawasaki Heavy Industries Ltd. (Japan)	Ministry of Petroleum	No. 8 Engineering Corp., Fushun, Liaoning	Co-production of enhanced oil recovery steam generator and ancillary equipment	Sino-British Trade Review (London), March 1987, p.15
03/00/87	Fairfield Industries Inc. (USA)	Anhui Oil Exploration Company	- - -	Seismic survey	Fairfield will survey five potential oil-bearing regions in Anhui, and will reprocess Anhui Oil Exploration Company seismic data. Oil and Gas Journal (Tulsa, OK), 16 March 1987, p.28
04/00/87	Asea AB. (Sweden)	Ministry of Water Resources and Electric Power	Power Research Institute, Beijing	High-voltage power transmission technology	China-Britain Trade Review (London), June 1987, p.15
04/00/87	Kellog Rust Synfuels (susidiary of The Signal Companies) (USA)	- - -	First Heavy Machinery Works, Fularji, Heilongjiang	Engineering fuel gas from coal gasification plant	China Business Review (Washington), September-October 1987, p.60

CHINA TECHNOLOGY TRANSFER
ENERGY

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
04/00/87	Total CFP; Technip; French Petroleum Institute (France)	- - -	Gaoqiao Refining Company, Shanghai	Joint production of paraffin wax hydrotreating units	China Business Review (Washington), September-October 1987, p.60
08/26/87	Linde AG TVT Munich (Federal Republic of Germany)	China National Technical Import Corp. (CNTIC)	Zhongyuan Oil Field, Henan	Natural gas liquefaction plant	The plant, financed by a World Bank loan, will process up to 1.2 million cubic meters of natural gas per day. The gas, which would otherwise have been flared, will yield dry natural gas, gasoline, butane and propane. China Daily (Beijing), 27 August 1987, p.2
10/12/87	GEC Switchgear (United Kingdom)	- - -	Shengli Oilfield,	Switchgear	GEC will supply 121 kilovolt sulphur hexaflouride gas insultated switchgear. Business China (Hong Kong), 12 October 1987, p.152
10/14/87	Brown Boveri Corp. (Switzerland)	Huaneng International Power Development Corporation	Shidongkou Powerplant, Shanghai	Equipment and technology for China's first super-critical coal-fired powerplant	The plant will be equipped with two 600 megawatt super-critical coal-fired pressure units. Brown Boveri will supply turbines and generators. China Daily (Beijing), 24 October 1987, p.2
12/00/87	Bristol Babcock Ltd. (United Kingdom)	- - -	Liaohe, Zhongyuan, and Shengli oilfields	Powerplant control systems	The "Network 3000" control system will monitor waste heat boilers, and gas and steam turbines at powerplants . The Shengli

CHINA TECHNOLOGY TRANSFER
ENERGY

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
					equipment will also control a water demineralization plant and 11 cooling towers. China-British Trade Review (London), December 1987, p.10

CHINA TECHNOLOGY TRANSFER
INSTRUMENTS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
01/00/87	Uniphase Corp. (USA)	- - -	Beijing Scientific Instruments Factory	Contract to transfer portion of helium-neon laser technology	China Business Review (Washington), May-June 1987, p.59
03/00/87	Jobin et Yvon, of Instruments S.A. (France)	- - -	Thirteen universities	Spectroscopes	Jobin et Yvon, a manufacturer of monochromatography and optical spectroscopes, will equip 13 Chinese universities and train their technicians and engineers in high-technology Raman spectroscopy. The project is funded by the World Bank. Monochromatography is used in industries for control purposes and for the analysis of minerals. Business China (Hong Kong), 23 March 1987, p.47.
03/00/87	International Image System Corp. (USA)	Oriental Scientific Instruments Import-Export Corp., Chinese Academy of Sciences	- - -	Service center in Beijing for image processing hardware and software	China Business Review (Washington), July-August 1987, p.61
03/00/87	Altometer Co. (Netherlands)	- - -	Shanghai Guanghua Instrument Factory	Joint venture to produce magnetic inductive flowmeters	China Business Review (Washington), July-August 1987, p.61
03/00/87	Wacom Corp. (Japan)	Computer Industry Bureau, Ministry of the Electronics Industry	No. 6 Yantai Radio Factory, Shandong	Assembly of standard digitizers	Standard digitizers are devices for reading characters and figures. Technical guidance will be provided by the North China Computer Technology Research Institute. Japan External Trade

CHINA TECHNOLOGY TRANSFER
INSTRUMENTS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
					Organization (JETRO) China Newsletter (Tokyo), No. 67, March-April 1987, p.21.
04/00/87	Olivetti Corp. (Italy)	China National Aero-Technology Import and Export Corp. (CATIC)	Beijing Maintenance Station	Repair and technical services for users of Olivetti equipment	The repair station, a joint venture, is located at the Great Wall Scientific Instrument Factory in Beijing, which develops precision testing devices for aviation. The joint venture will repair Olivetti electronic typewriters and microcomputers, and offer technical and consulting services. Beijing Review, 11 May 1987, p.31
04/00/87	International Submarine Project Co. (Canada)	- - -	Jiaotong University, Shanghai	Remote-controlled underwater device	The contract calls for joint development of a remote-controlled underwater device for offshore oil exploitation and salvage work. The two parties will also establish a China-Canada underwater research center. Beijing Review, 11 May 1987, p.31
05/00/87	Shimadzu Corp. (Japan)	China National Meters Import-Export Corp.	- - -	Technical cooperation in production of a flourescence spectrophotometer and a mass spectrometer for gas chromatography	Japan External Trade Organization (JETRO) China Newsletter (Tokyo), No. 68, May-June 1987, p.24

CHINA TECHNOLOGY TRANSFER
INSTRUMENTS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
05/00/87	MDA Scientific Inc. (USA)	Beijing Everbright Industrial Co.; Jilin Chemical Industry Corp.		Toxic gas monitoring systems	China Business Review (Washington), September-October 1987, p.56
05/00/87	Westinghouse Corp. (USA)	East China Power Administration; Guangdong Power Bureau	Wangting and Guangdong Power Plants; Panzihua Steel Mill	Control and automation services	China Business Review (Washington), September-October 1987, p.58
05/28/87	Philips Corp. (Netherlands)	Shenzhen Advanced Science and Technology Corp.	Shen Fei Optical Systems Company, Shenzhen	Joint venture to manufacture laser optical systems	The factory will produce video disks and optical disks, as well as video and compact disk players. Business China (Hong Kong), 8 June 1987, p.86; Ta Kung Pao Weekly Supplement (Hong Kong), 28 May 1987, p.4
07/00/87	Showa Denko K.K. (Japan)	Chemical Research Center, Chinese Academy of Sciences	- - -	Development of detectors for high speed liquid chromatography based on chemoluminescence	Japan External Trade Organization (JETRO) China Newsletter (Tokyo), No. 69, July-August 1987, p.22
08/00/87	Toledo Scale Corp. (USA)	Jiangsu Electronic Scale Co.	Changzhou-Toledo Electronic Scale Co.	Joint venture to produce electronic scales	China Business Review (Washington), January-February 1988, p.61
09/00/87	Mine Safety Appliances Co. (MSA) (USA)	- - -	Wuxi Chemical Instruments Factory, Jiangsu	Joint venture to produce instruments to detect hazardous gases	China Business Review (Washington), January-February 1988, p.52

CHINA TECHNOLOGY TRANSFER
MACHINERY

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
01/00/87	Japan Servo Ltd. (Japan)	- - -	Changzhou Electrical Machinery and Instrument Factory, Jiangsu	Plant to manufacture stepping motors	China Business Review (Washington), May-June 1987, p.59
02/00/87	Eastman Christensen Corp. (USA)	Sichuan Petroleum Administration Bureau	ChuanShi Christensen Diamond Bit Co., Chengdu	Joint venture to produce natural and synthetic diamond drill bits	China Business Review (Washington), July-August 1987, p.60
03/00/87	DeVlieg Machine Co. (USA)	China Machine Building International Corp.	Weihai Machine Tools Accessories Plant, Shandong	License for production of tooling systems and metal-cutting tools	China Business Review (Washington), July-August 1987, p.59
03/09/87	The World Bank (USA)		Shanghai Machine Tool Corporation	Modernization Project	The World Bank approves a $100 million loan for the rehabilitation and modernization of 18 factories and research institutes owned by the Shanghai Machine Tool Corporation. The project includes importing manufacturing design technology, establishing a modern management system, and developing a training program for managers and engineers. China Daily (Beijing), 9 March 1987, p.2
04/00/87	Butler Newall Machine Tool Ltd. (United Kingdom)	- - -	Beijing Jeep Corp.	Numerically-controlled camshaft grinding machines	China-Britain Trade Review (London), June 1987, p.14
04/00/87	KTM Co. (United Kingdom)	- - -	Dalian Machine Tool Company, Liaoning	Machining centers and systems software package	China Business Review (Washington),

CHINA TECHNOLOGY TRANSFER
MACHINERY

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
					September-October 1987, p.59
05/21/87	Caterpillar Inc. (USA)	China National Technical Import Corp.	Twelve factories of the State Commission of Machine-Building Industry	Technology for manufacture of tracked tractors, wheeled loaders, log skidders, and diesel engines	Caterpillar will provide expertise, consulting, engineering and manufacturing technology, and training in both the United States and China. China Daily (Beijing), 22 May 1987, p.2
06/12/87	Ingersoll-Rand Co. (United Kingdom)	State Commission of Machine-Building Industry	Xuanhua Pneumatic Machinery Factory, Hebei; Shanghai Compressor Factory	Production of rock drilling machinery and portable air compressors	The two joint ventures, with a total investment of $7 million, will be supported by the Hong Kong-based Ingersoll-Rand China Ltd., which will provide management and technical support. Beijing Review, 22 June 1987, p.31.
08/00/87	G & B Automated Equipment Ltd. (Canada)	China National Machinery Import-Export Corp.	- - -	Computerized technology to produce grinding wheels	G & B signs three contracts worth $21.5 million. China Business Review (Washington), January-February 1988, p.59
08/00/87	Lucas Corp. (United Kingdom)	- - -	Luoyang Tractor Factory, Henan	Diesel injection technology	China Business Review (Washington), March-April 1988, p.62
11/00/87	Multi-Arc Vacuum System Inc. (USA)	- - -	Chengdu Measuring and Cutting Tools Works, Sichuan	Computer-controlled system to produce titanium-coated drill bits	China Trade Report (Hong Kong), January 1988, p.11

CHINA TECHNOLOGY TRANSFER
MACHINERY

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
11/00/87	NEI Thompson Ltd. (United Kingdom)	Tianjin Heavy Machinery Corp.	- - -	Joint manufacture of friction welding machines	China-Britain Trade Review (London), November 1987, p.3

CHINA TECHNOLOGY TRANSFER
MANAGEMENT

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
01/05/87	Act Enterprises Ltd. (Singapore)	Tianjin Municipal Science and Technology Co.	Tianjin International Science and Technology Consultants Co.	Joint-venture consulting firm	The new venture will concentrate on international science and technology markets, and on the design, production, and sale of high-technology products. It will offer Chinese enterprises the services of foreign experts resident in Tianjin, and will train technical and managerial personnel. China Daily (Beijing), 5 January 1987, p.3
06/03/87	American Telephone and Telegraph Corp. (USA)	- - -	- - -	Management training program	AT&T proposes a Management Fellowship Program, to train Chinese officials in managing the introduction, utilization, and growth of technologies. The program will enroll 25 officials in 1988 and 25 more in 1989. Study at a major US university followed by work within AT&T will be part of the program. China Daily, Business Weekly (Beijing), 8 June 1987, p.1
11/00/87	Kapiti Ltd. (United Kingdom)	Bank of China	- - -	Automated trade financing software	China Business Review (Washington), March-April 1988, p.59

CHINA TECHNOLOGY TRANSFER
METALLURGY

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
01/00/87	BNF Metals Technology Center (United Kingdom)	Beijing Research Institute for Mining and Metallurgy	Copper Refinery, Zhuzhou, Hunan	Aid in modernizing the refinery	China Business Review (Washington), May-June 1987, p.59.
01/00/87	Nisshin Steel Co. (Japan)	China National Metallurgical Products Import and Export Corp.	Taiyuan Iron and Steel Corp., Shanxi	Technology to improve cold-rolled stainless steel plates	China Business Review (Washington), May-June 1987, p.59
02/00/87	Kaiser Engineers and Constructors Inc. (USA)	China National Technical Import Corp.	Baoshan Steel Works, Shanghai	Design and supply computer-aided heating control system for metallurgical coke facility	China Business Review (Washington), May-June 1987, p.59
02/00/87	Keytech Co. (USA)	Chengdu Seamless Steel Tube Plant; Deyang No. 2 Heavy Machinery Factory, Sichuan	Hua Mei Steel Tube Engineering Corp.	Joint venture to produce steel tube equipment	China Business Review (Washington), May-June 1987, p.61
03/00/87	Lamp Metals Ltd. (United Kingdom)	- - -	Ganzhou Tungsten and Molybdenum Materials Plant, Jiangxi	Processing machines	The equipment includes inspection instruments to permit the fine drawing of tungsten wire, and will increase the plant's production by 50 percent. China-Britain Trade Review (London), April 1987, p.21
03/00/87	Outokumpu Oy (Finland)	- - -	Zhengzhou Cable Works, Henan	Production line for continuous current-bearing copper wire	China Business Review (Washington), July-August 1987, p.61
03/00/87	Mesta Engineering Co. (USA)	- - -	Capital Iron and Steel Complex, Beijing	Highly automated, twin-strand continuous slab caster and related technical	China Business Review (Washington), September-October 1987,

CHINA TECHNOLOGY TRANSFER
METALLURGY

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
				services	p.59
04/00/87	Kanthal Corp. (Sweden)	Capital Iron and Steel Corp.	Shougang-Kanthal Co., Beijing	Joint venture to produce wire	The joint venture produces 500 tons per year of high-resistance and heat-resistant iron-chromium-aluminum and nickel-chromium alloy wire, using technology and equipment from Kanthal. The products are used in electrical appliances, industry, and defense. Beijing Review, 20 April 1987, p.26
04/13/87	Wrought Copper Ltd. (Chile)	Beijing Nonferrous Metals Industrial Corp.	Beijing-Santiago Copper Tube Company	Joint venture to produce copper tubing	Chile will provide copper at preferential prices. Production equipment will be imported from the Wednesbury Tube Company of Britain. China Daily (Beijing), 13 April 1987, p.2
05/00/87	Sumitomo Metal Industries Ltd. (Japan)	China National Agricultural Machinery and Equipment Import and Export Corp.	No. 1 Tractor Factory, Luoyang, Henan	Technical assistance with forging	Japan External Trade Organization (JETRO) China Newsletter (Tokyo), No. 68, May-June 1987, p.24
07/00/87	Hitachi Zosen Corp.; Nissho Iwai Corp. (Japan)	China National Machinery Corp. for Foreign Economic and Technical Cooperation	Baoshan Steel Works, Shanghai	Sintering plant	The plant will sinter the iron ore into a solid mass to increase the efficiency of blast furnaces. Japan External Trade Organization (JETRO) China Newsletter (Tokyo), No. 69, July-August 1987

CHINA TECHNOLOGY TRANSFER
METALLURGY

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
07/06/87	Aluminum Smelters of Victoria Ltd. (Australia)	China International Trust and Investment Corp. (CITIC)	Bohai Aluminum Corp.	Expansion of smelter	Bohai Aluminum Corp. will be enlarged into an aluminum processing base, producing aluminum plate and foil. It expects to export about 50 percent of its products. China Daily, Business Weekly , (Beijing), 6 July 1987, p.1
08/30/87	Paul Wurth S.A. (Luxembourg)	China National Metallurgical Import and Export Corp.	Anshan Iron and Steel Complex; Wuhan Iron and Steel Complex; Baoshan Iron and Steel Complex; Liuzhou Iron and Steel Plant	Renovation of blast furnaces	The blast furnaces will be equipped with a bell-less top charging system and automated monitoring and control systems. Under other contracts Wurth will transfer its "LBE process" technology for steelmaking and its slag granulation system which uses slag to produce high quality cement. China Daily, Business Weekly (Beijing), 31 August 1987, p.1
09/19/87	Krupp Corp. (Federal Republic of Germany)	- - -	Beijing Copper Mill	Assembly line for copper rods	The computer-controlled assembly line, the largest in China, is an automated production process, combining smelting, casting, rolling, and forming. It has an annual capacity of 65,000 tons of copper rod. Ta Kung Pao Weekly Supplement (Hong Kong), 24 September 1987, p.5
10/26/87	Kaiser Engineers Inc. (USA)	Ministry of the Metallurgical	Meishan Metallurgical	Feasibility study for upgrading steel plant	Kaiser Engineers is awarded a $5 million

CHINA TECHNOLOGY TRANSFER
METALLURGY

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
		Industry	Corporation		contract to study the feasibility of upgrading the Meishan iron plant, on the Changjiang near Nanjing, to a steel complex producing 2 million tons per year of steel sheets and plates. China Daily, Business Weekly (Beijing), 26 October 1987, p.2
11/16/87	Danieli Corp. (Italy)	Hua Ning International Technical and Trading Corp., Jiangsu	Nanjing Iron and Steel Complex	Single-strand, high-speed wire rod mill	The rolling mill can produce 200,000 tons of wire per year. Hua Ning International Technical and Trading Corp. will receive the manufacturing technology for key equipment and drawings of accessory equipment free of charge. China Daily, Business Weekly (Beijing), 16 November 1987, p.2

CHINA TECHNOLOGY TRANSFER
MILITARY

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
03/08/87	US Naval Training Center, Orlando, Florida (USA)	PLA Navy; China Ocean Shipping Company	- - -	Training in torpedo maintenance	One Chinese naval officer and six technicians from the state shipping corporation, the first Chinese students to enroll in a military training course in the United States, are taking the 41-week torpedo basic maintenance course at the US Naval Training Center in Orlando, Florida. In 1986 China agreed to purchase a small number of Mark 46 antisubmarine torpedoes, along with the launchers, technology and production facilities. Washington Post, 8 March 1987, p.A35
04/02/87	Aerospatiale Co. (France)	PLA	- - -	Antitank helicopters and missiles	The PLA signs a contract for 8 Gazelle antitank helicopters and HOT antitank missiles. The helicopters will be delivered by the middle of 1988. Agence France Press (AFP), (Hong Kong), 2 April 1987, in FBIS/China, 3 April 1987, p.G1
08/00/87	Thomson-CSF Corp. (France)	PLA Air Force	- - -	Avionics systems for the A-5 attack plane	China's PLA Air Force signs a memorandum of understanding with a consortium of French avionics companies to develop a navigation and attack system to retrofit on A-5 attack planes. The main elements are an inertial navigation unit developed by SAGEM, a

CHINA TECHNOLOGY TRANSFER
MILITARY

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
					T-CSF head-up display, and a TRT radio altimeter. Last year China Aero-Technology Import Corporation (CATIC) agreed to develop a new avionics system for the A-5 in cooperation with Italy's Aeritalia, but it now appears that that agreement refers only to A-5s intended for export. The French systems will equip aircraft in service with the PLA Air Force. Interavia (Geneva, Switzerland), August 1987, p.784
08/00/87	Grumman Aerospace Corp. (USA)	PLA Air Force	- - -	Avionics systems for F-8 fighter aircraft.	The US Air Force selects Grumman to provide 55 integrated avionics system kits plus support equipment and training to the PLA Air Force for its F-8 fighter. The first contract, worth $145 million, covers the fire control system and includes flight tests, support equipment and computer software. The second contract, worth an estimated $100 million, provides program management services, operational support and initial and replenishment spare parts until January 1995. International Defense Review (Geneva, Switzerland), September 1987, p. 139

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MILITARY

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
08/03/87	Aeritalia (Italy)	China National Aero-Technology Import and Export Corp. (CATIC)	Nanchang Aircraft Manufacturing Corp., Jiangxi	Avionics for A-5 fighter planes	The avionics package, for use in the export model of the A-5, consists of two central computers, a dual redundant Mil-Std-1553B digital data bus, radar ranging and inertial navigation systems, an air data computer, and a head-up display. The package will be delivered in early 1989. Aviation Week and Space Technology (New York), 10 August 1987, p.32
09/12/87	Racal Marine Systems (United Kingdom)	China State Shipbuilding Corp.	- - -	Weapon and electronic systems for small warships	Racal will act as Ships Weapons Systems Authority (SWSA) with responsibility for the total weapons and electronic outfitting of fishery protection vessels, offshore patrol vessels, antisubmarine corvettes and multi-role corvettes. The ships will employ a Chinese 60-meter hull and Chinese engines, and be sold on the international market. Jane's Defence Weekly (London), 12 September 1987, p.499
10/00/87	Government (France)	Government, China	- - -	Military cooperation agreement	The two governments sign an agreement on military cooperation. The agreement stresses the intention of both governments to strengthen industrial cooperation in the production of military materiel.

CHINA TECHNOLOGY TRANSFER
MILITARY

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
					Military Technology (Bonn), October 1987, p.149

CHINA TECHNOLOGY TRANSFER
MISCELLANEOUS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
07/22/87	Australian Industrial Pipe System Ltd.; Esdan Lavel Ltd. (Australia)	Lingyun Machinery Factory (China North Industrial Corp. (NORINCO))	Chinaust Plastic Corp., Shijiazhuang, Hebei	Joint venture to produce plastic pipe	The joint venture will import production lines from the two Australian companies and machines from Australia, Italy, and the Federal Republic of Germany, and will produce plastic and nylon gas pipes and develop new plastic products. Xinhua (Beijing), 22 July 1987, in FBIS/China, 22 July 1987, p.E1
08/00/87	Laser Lab Ltd. (Australia)	- - -	Zhuzhou Electric Locomotive Works, Hunan	Laser machine to cut sheet metal	China Business Review (Washington), January-February 1988, p.62
09/14/87	Tokyo Cosmos Denki Corp. (Japan)	China North Industries Corp. (NORINCO)	Zhongnan Photoelectric Instrument Factory, Nanyang, Henan	Optical sensor manufacturing plant	The sensors are cadmium sulfide optical electric conductive cells, used in automatic light meters. The plant will be the first of its kind in China. Nihon Kogyo Shimbun (Tokyo), 14 September 1987
09/25/87	University of Karlsruhe (Federal Republic of Germany)	State Science and Technology Commission	Beijing Institute for Computer Application	Computer datalink	The datalink, which uses two Siemens computers, in Beijing and in Karlsruhe, connects China with more than 10,000 scientific research institutes, universities and computer manufacturers around the world. It is a breakthrough in the integration of China's universities and research institutes with the

CHINA TECHNOLOGY TRANSFER
MISCELLANEOUS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
					worldwide computer network. China Daily (Beijing), 25 September 1987, p.3
09/28/87	Xerox Corp. (USA)	Shanghai Movie and Photo Industrial Co.; Bank of Communications, Shanghai Branch	Xerox Shanghai	Joint venture to produce copiers and components	When fully operational in 1991 the company will produce machines and components for 30,000 copiers a year and will export parts, components and complete machines. China Daily, Business Weekly, 28 September 1987, p.1

CHINA TECHNOLOGY TRANSFER
SPACE

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
12/00/87	McDonnell Douglas Corp. (USA)	China Great Wall Industries Co.	- - -	Payload Assist Module (PAM) for LONG MARCH rockets	McDonnell Douglas signs a technical assistance agreement for possible use of the Payload Assist Module (PAM), which was developed in the mid 1970s to fly as the third stage of the US Delta rocket. It would be used with China's LONG MARCH series of rockets. Spaceflight (London, UK), December 1987, p.405
12/00/87	Ministry of Research and Technology (Federal Republic of Germany)	State Science and Technology Commission	Great Wall Industrial Corporation	Cooperation in space microgravity research	Twelve joint projects will use Chinese recoverable satellites, and involve sharing of resources and equipment and exchange of scientists. China-Britain Trade Review (London), January 1988, p.21

CHINA TECHNOLOGY TRANSFER
TELECOMMUNICATIONS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
01/09/87	Ericsson Corp. (Sweden)	Unspecified government body	- - -	Radio systems	The systems, based on Ericsson's TC 549 radio exchange, include base stations, mobile, and portable installations. Several mobile switching and encryption units are also included. China Business and Trade (Washington), 9 January 1987, p.1
01/14/87	BellSouth International Corp. (USA)	- - -	Shanghai Centre	Voice-data equipment and service	Shanghai Centre, a multi-use real estate project being developed by a number of investors from Hong Kong, Japan and the United States, grants an 18-year contract to BellSouth International. The system will include digital PBX (private branch exchange) and high-speed transmission capability, providing tenants with telex, facsimile, central computng and word-processing services. Communications Daily (Washington), 14 January 1987, p.8
01/19/87	Nokia Corp. (Finland)	Ministry of Railways	Datong to Qinhuangdao rail line	Telephone switching and optical fiber systems	This equipment, the most sophisticated yet imported by China, will be installed along the new rail line linking the coal district of Datong with the port of Qinhuangdao. Six contracts for telecommunications facilities now have been signed with foreign

CHINA TECHNOLOGY TRANSFER
TELECOMMUNICATIONS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
					suppliers. Asian Wall Street Journal (Hong Kong), 21 January 1987, p.10
02/00/87	Racal-Milgo Co. (USA)	Civil Aviation Administration of China (CAAC)	- - -	Data communications system	The equipment will upgrade CAAC's reservation system. It includes the Racal-Milgo CMS (Communications Management System) and Omni-mode intelligent modems. The system, based in Hong Kong, will link Hong Kong with Guangzhou and later with Shanghai, Beijing, Nanjing and Guilin. Business China (Hong Kong), 23 February 1987, p.31
02/04/87	Parry Corp. (Australia)	China National Instruments Import and Export Corp. (Instrimpex); China Central Television	International Telecommunications Center, Beijing	Joint venture in telecommunications services	The International Telecommunications Center, a $44 million investment, will be completed in time for the 1990 Asian Games in Beijing. ICOM of Australia and COMSAT of the USA will supply telecommunications equipment and services. Business China (Hong Kong), 9 February 1987, p.22
05/00/87	Leemah Datacom Security Corp. (USA)	- - -	Zhongyuan Radio Factory, Wuhan	Cooperation in manufacture of modems	China Business Review (Washington), September-October 1987, p.58

CHINA TECHNOLOGY TRANSFER
TELECOMMUNICATIONS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
05/00/87	Kabmatik AB (Sweden)	China National Technical Import Corp.	No. 2 Cable Factory, Tianjin	Production line for cables	China Business Review (Washington), September-October 1987, p.61
05/00/87	Siemens Corp. (Federal Republic of Germany)	Ministry of Telecommunications	- - -	Digital program-controlled telephone switching system	China-Britain Trade Review (London), August 1987, p.17
05/11/87	American Telephone and Telegraph Corp. (USA)	Ministry of Railways	- - -	Switching system	The switching system, handling more than 12,000 lines, will serve as the core of the Ministry of Railways' national network. China Daily Business Weekly (Beijing), 8 June 1987, p.1
07/00/87	Messerschmitt-Boelkow Blohm, Space Systems Corp. (MMB) (Federal Republic of Germany)	Great Wall Industry Corp.	- - -	Cooperation on communications satellite	MMB will supply equipment and cooperate on the design of a DFH-3 broadcasting and communications satellite, which China plans to launch in the early 1990s. China-Britain Trade Review (London), August 1987, p.15
08/00/87	Fujitsu Corp. (Japan)	Ministry of Posts and Telecommunications	Fujian Fujitsu Communications Software, Fuzhou, Fujian	Joint venture to produce software for digital telephone switching systems	Business China (Hong Kong), 31 August 1987, p.127
10/00/87	Ericsson LM Telephone Co. (Sweden)	Liaoning Provincial Posts and Telecommunication Bureau	- - -	Telephone equipment and training centers	Ericsson signs a $26.7 million contract to install more than 100,000 telephone lines in the

CHINA TECHNOLOGY TRANSFER
TELECOMMUNICATIONS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
					major cities of Liaoning, and to establish three centers for personnel training, maintenance, and management of Liaoning's telephone system. China-Britain Trade Review (London), November 1987, p.15
10/20/87	Cable and Wireless Worldwide Communications Group (United Kingdom)	Tianjin Posts and Telecommunications Administration	- - -	Cooperation in development of digital telecommunications system	Cable and Wireless will assist the Tianjin Posts and Telecommunications Administration to plan for the installation of the latest digital telecommunications equipment. Chinese managers will visit Cable and Wireless companies in Hong Kong to study modern telecommunication services management. Ta Kung Pao Weekly Supplement (Hong Kong), 22 October 1987, p.4.
11/00/87	Plessy Ltd. (United Kingdom)	Ministry of Railways	- - -	Digital telephone exchanges	Plessy will supply 26 "System X" digital telephone exchanges, worth $ 3.05 million. The system will have a capacity of 24,000 lines and be used in the railway system. Business China (Hong Kong), 16 November 1987, p.166
11/00/87	Power Bureau (Norway)	China National Instruments Import and Export Corp.	Beijing Marine Communications and Navigation Co.	Equipment for satellite communications system	An international marine satellite earth station will be established in Beijing for marine

CHINA TECHNOLOGY TRANSFER
TELECOMMUNICATIONS

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
					satellite communications in the Pacific and Indian oceans. China-Britain Trade Review (London), January 1988, p.21
12/00/87	American Telephone and Telegraph Corp. (USA)	China National Instruments Import and Export Corp.	Xiinhua News Agency	Information processing system	The $2.8 million system includes the advanced 3B2 500 computer system and will connect Xinhua's 30 departments in China and the numerous offices around the world. Dai Beihua, "Xinhua To Install Processing System," China Daily (Beijing), 14 January 1988, p.2
12/03/87	Farmstead Telephone Group (USA)	Hua Yu Electronic Technical Co.	Joint venture, Beijing	Telephone lines and equipment	Farmstead will provide 4.5 million central office telephone lines and equipment for rural China. China Trade Report (Hong Kong), February 1988, p.15

CHINA TECHNOLOGY TRANSFER
TRANSPORTATION

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
02/00/87	Komatsu Ltd. (Japan)	China National Heavy Machinery Corp.	First Heavy Machinery Works, Shanghai; Taiyuan Heavy Machinery Plant; Qiqihar No. 2 Tool Plant	Technology to manufacture large presses used in motor vehicle production	China Business Review (Washington), July-August 1987, p.62
03/00/87	Terex Equipment Ltd. (United Kingdom)	China North Industries Corp. (NORINCO)	Factory in Baotou, Nei Mongol	Joint venture to produce dump trucks	The joint venture, North Hauler Ltd., will produce Terex dump trucks of 30-, 40-, 50-, and 77-ton capacity. Other models of loaders, scrapers and haulers may eventually be produced. Terex will supply specialized manufacturing and tooling equipment to an existing factory that has produced heavy military vehicles. Sino-British Trade Review (London), March 1987, p.7
05/00/87	Aerospatiale Corp. (France)	China Aero Technology Import and Export Corp. (CATIC)	- - -	Cooperation in development of an advanced helicopter	CATIC signs a technical cooperation agreement for joint development of a follow-on helicopter to Aerospatiale's AS 350 Ecureuil. CATIC will contribute up to one-third of the program costs, and is understood to be interested in licensed production of the new helicopter, which is expected to enter service in the 1990s. Asian Aviation (Singapore), May 1987, p.57
05/00/87	Daimler-Benz AG (Federal Republic	- - -	Nos 1 and 2 Machinery Plants,	Manufacturing technology for	China Business Review

CHINA TECHNOLOGY TRANSFER
TRANSPORTATION

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
	of Germany)		Baotou, Nei Mongol	heavy-duty trucks	(Washington), September-October 1987, p.61
07/20/87	Bendix/King General Aviation Avionics Division, Allied-Signal Aerospace Co. (USA)	China Aviation Supply Corporation	Civil Aviation Administration of China (CAAC), Guangzhou Division	Retrofit avionics to turboprop transports	Five AN-24 and five Y-7 twin-engine turboprop transports will be fitted with remote mounted avionics. China Daily, Business Weekly (Beijing), 20 July 1987, p.3
07/21/87	Chrysler Corp. (USA)	Machine Building Industry Commission	First Automobile Works, Changchun, Jilin	Technology for four-cylinder engines	Chysler will provide complete technology for 1.8, 2.2 and 2.5 liter engines. The agreement includes engineering, design, and manufacturing technology, as well as future improvements to the engines or manufacturing process. The engines will be produced at a new plant in Changchun, which is expected to go into operation by the the second half of 1989. Xinhua (Beijing), 21 July 1987, in FBIS/China, 23 July 1987, pp.B3-4.
08/00/87	Kolbenschmidt AG (Federal Republic of Germany)	- - -	Shanghai Piston Factory	Agreement for production of aluminum pistons	China Business Review (Washington), March-April 1988, p.62
09/00/87	Urban Transportation Development Corporation Ltd. (UTDC) (Canada)	- - -	Xiangtan Electrical Manufacturing Works, Hunan	Joint venture to supply subway cars to Beijing	China Transport (Hong Kong), Issue 4, 1987, p.65

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TRANSPORTATION

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
09/00/87	Pratt and Whitney (USA)	China National Aero-Technology Import and Export Corp. (CATIC)	- - -	Cooperation in development and production of a new FT-8 steam turbine engine	China Business Review (Washington), January-February 1988, p.62
10/15/87	Detroit Diesel Allison Division, General Motors Corp. (USA)	China National Technical Import and Export Copr.	Beijing Heavy-Duty Truck Manufacturing Factory	Technical service center for diesel engines	The center will offer repair and technical training services for the more than 8,000 engines and gearboxes China has imported from Detroit Diesel Allison. China Daily (Beijing), 15 October 1987, p.2
10/15/87	Messerschmitt-Bolkow-Blohm (MMB) (Federal Republic of Germany)	China National Aero-Technology Import and Export Corp. (CATIC)	- - -	Agreement for cooperation in the preliminary phase of the MPC 75 regional transport aircraft	This is China's first cooperation with a foreign aircraft manufacturer in all the activities involved in the development of a new aircraft--from the feasibility study to design and marketing forecasts. Xinhua, 15 October 1987 in FBIS/China, 15 October 1987, p.10
10/19/87	Lufthansa Airlines (Federal Republic of Germany)	Civil Aviation Administration of China (CAAC)	Beijing Municipal Commercial Service and Network Development Corporation	Joint venture aircraft maintenance center	When completed in 1989 or 1990, the maintenance center in Beijing will be able to repair all types of Boeing aircraft as well as Airbuses and other aircraft. Lufthansa's main investment will be for a new engine repair shop. Lufthansa will open a technical school to train technicians and engineers.

CHINA TECHNOLOGY TRANSFER
TRANSPORTATION

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
					China Daily, Business Weekly (Beijing), 19 October 1987, p.1
10/24/87	Pirelli Group (Italy)	China National Chemical Construction Corp.	- - -	Contract for cooperation in production of radial tires	The $12.86 million project will be financed by the Italian government with a soft loan and special export credits. China Daily (Beijing), 24 October 1987, p.2
11/00/87	Lavalin International (Canada)	Municipality of Beijing	- - -	Study of proposed light rail extension to Beijing subway	The study is being carried out in conjunction with Metro Canada International Ltd. The Canadian firms hope for further engineering and project management contracts in Beijing and other Chinese cities. China Transport (Hong Kong), Issue 4, 1987, p.65
11/00/87	South Wales Switchgear Ltd. (United Kingdom)	China National Technical Import Corp.	Datong-Qinhuangdao Rail Line	Trackside switching stations for railroad electrification	China-Britain Trade Review (London), November 1988, p.9
11/00/87	Swedavia AB (Sweden)	Civil Aviation Administration of China (CAAC)	- - -	Training and equipment	Swedavia will train CAAC technicians in Sweden, assist CAAC with an accident prevention and investigation course, and train air controllers. CAAC will purchase ATS (air traffic services) simulators. China-Britain Trade Review (London), January 1988, p.18

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TRANSPORTATION

DATE	FOREIGN FIRM/COUNTRY	CHINESE FIRM	CHINESE END USER	ITEM	COMMENTS/SOURCE
11/07/87	Isuzu Corp. (Japan)	Beijing No. 2 Automobile Works, China International Trust and Investment Corporation (CITIC)	Beijing Light Automobile Co.	Technology for production of light trucks	The new venture, with 70 percent of the investment coming from the Beijing No.2 Automobile Works, 25 percent from Hong Kong's Shortridge Ltd., and 5 percent from CITIC, will use the technology of Isuzu's "N" series light trucks. By 1992 it expects to produce 40,000 Isuzu-based light trucks a year, increasing production to 100,000 by 1997. China Daily (Beijing), 7 November 1987, p.2
12/00/87	Mercedes-Benz Corp. (Federal Republic of Germany)	- - -	Truck Factory, Baotou, Nei Mongol	Cooperation on production of heavy-duty trucks	China-Britain Trade Review (London), March 1988, p.14.